dergo limb reconstruction after resection of a bone tumor (87% primary union rate) and for forearm or mandibular defects (100% primary union rate). For the most difficult cases of chronic osteomyelitis, 60% of vascularized grafts ultimately heal.

Vascularized bone grafts have the advantage of maintaining a physiologic blood supply, thus not depending on subsequent revascularization; preserving live osteocytes, osteoblasts and osteoclasts, and greater bone strength. Contraindications to microvascular transfer of bone include a patient who is a poor risk for a lengthy operative procedure, a limb with limited salvage potential and where there is a probability of success with a conventional bone graft.

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Immediate Stabilization of Fractures in Patients With Multiple-Systems Injuries

SEVERE HEAD INJURY and uncontrolled hemorrhage remain the primary causes of early death in victims of multiple-systems trauma. If a victim survives the first 24 to 48 hours, the most common cause of death is adult respiratory distress syndrome (ARDS), followed by multiple-systems organ failure and sepsis.

Traditionally, treatment of fractures has been relegated to the lowest priority during the initial treatment phase. Recent evidence suggests, however, that immediate stabilization of unstable fractures of the femur, pelvis and occasionally the spine may play a major role in reducing the morbidity and mortality in these patients. Immediate stabilization of other long bone fractures, such as the humerus, may be indicated as well.

Immediate stabilization of fractures offers many advantages in patients with multiple-systems injuries: Stabilization of fractures significantly reduces pain, which reduces the need for narcotics. Narcotics are respiratory and cerebral depressants, and their use increases the need for ventilatory support and possibly the incidence of ARDS. Fracture stability facilitates nursing care and increases patient mobility, permitting a vertical chest position essential for pulmonary care. Greater patient mobility also lowers the incidence of decubitus ulcers, thrombophlebitis and other phenomena associated with prolonged bed rest. Immediate fracture stability allows joints and muscles to be rehabilitated earlier, resulting in an earlier return to function and a better long-term result from musculoskeletal injuries. A group of patients with immediate stabilization of major fractures was compared with a historical control in which early fracture stabilization was not done. When the injury severity score was between 26 and 40, early fracture stabilization reduced the incidence of ARDS from 32% to 9%, mortality dropped from 9.3% to 3.4% and length of hospital stay was cut by 50%. Others have shown similar outcomes.

Immediate stabilization of fractures in these polytrauma patients can be challenging, as the fractures are often complex and open. One or more surgical teams experienced in the treatment of patients with multiple injuries are usually necessary to achieve immediate stabilization of major fractures without undue morbidity.

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Recent Advances in the Treatment of Chronic Posttraumatic Osteomyelitis of the Tibia

THE PERSISTENCE of bone infection can be attributed to the presence of sequestrum, nonunion of a fracture or retained metal used for internal fixation. Control of bone infection requires debriding all sequestra and surrounding necrotic tissue with the administration of appropriate antimicrobial therapy. In ununited tibial fractures, bone debridement followed by cancellous bone-grafting procedures and external fixation have achieved a high rate of bony union. Following healing of the fracture, infection is more easily managed and in many instances eradicated.

Optimal treatment of chronic osteomyelitis of the tibia is often adversely affected by the absence of an adequate soft tissue envelope. The use of local muscle flaps to reestablish adequate soft tissue coverage improves infection control. In addition, recent advances in microvascular techniques have allowed for the transfer of muscle, myocutaneous, osseous and osteocutaneous flaps to the tissue-deficient site. In our experience, the use of local muscle flaps or vascularized free-tissue transfers, in combination with appropriate orthopedic procedures and antimicrobial therapy, has resulted in an increased success rate in the treatment of this difficult problem.

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Biopsy of Primary Bone Tumors

IN THIS ERA of limb salvage, the "simple" biopsy is a crucial determinant of patient outcome. Precautions relate to the timing of biopsy, the type of biopsy, the direction of incisions, arthroscopic biopsy, the extent of a biopsy and the use and placement of wound suction.

Biopsy trauma alone may increase the apparent tumor extent as seen on imaging studies. Therefore, all local staging procedures—that is, isotope scans, angiograms, computed tomography and magnetic resonance imaging—should be done before the biopsy. An open biopsy is usually best.